UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,767	06/06/2005	Yuki Endo	Q88255	5081

65565 7590 12/28/2006

SUGHRUE-265550
2100 PENNSYLVANIA AVE. NW
WASHINGTON, DC 20037-3213

EXAMINER	
LEE, JAE W	
ART UNIT	PAPER NUMBER
1656	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/28/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,767	ENDO ET AL.	
	Examiner	Art Unit	
	Jae W. Lee	1656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☒ Claim(s) *8 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/537,767.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/06/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Application status

Claims 1-9 are pending in this application.

Preliminary amendment for drawings, filed on 08/10/2005, is acknowledged.

Priority

A claim of priority to the (1) PCT/JP03/1556, filed on 12/04/2003, (2) JAPAN 2002-354155, filed on 12/05/2002, and (3) JAPAN 2003-206952, filed on 08/08/2003, is acknowledged.

Objections to the Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The instant application contains abstract with legal phraseology, such as "aforementioned."

The specification is objected to for inappropriate notation of an Internet address. In paragraph [0137], Internet address is cited in an unacceptable form. See M.P.E.P. 707.05(e) for the acceptable notation of an Internet address. The examiner suggests the replacement of Internet citations with appropriate references because Internet pages are subjected to frequent changes and deletions and could be different when the public accesses the Internet page to view the exactly same information.

Appropriate correction for each error is required.

Claim Objections

Claims 1 and 3-9 are objected to because of the following informalities:

Claims 8 and 9 are objected to under 37 CFR 1.75(c) as being in improper form because they reference back to another multiple dependent Claim 6. See MPEP § 608.01(n). Accordingly, the Claims 8 and 9 have not been further treated on the merits..

Claims 1 (claims 3-5 dependent therefrom) and 6 (7 dependent therefrom), are objected to because the recitation of "Atk2" should be in parenthesis and follow the phrase it abbreviates when used for the first time.

Claim 3 is objected to because the recitation of "coding" should be improved with respect to clarity. The Examiner suggests the following phrase, --- encoding ---.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. The claimed polypeptide, as written, does not sufficiently distinguish over the naturally occurring polypeptide that binds to Akt2, which is expressed widely in various tissues because of its involvement in the glucose metabolism (See Whiteman et al., Trends in Endocrinology & Metabolism, 2002, 13(10): 444-451). The claims do not particularly point out any non-naturally occurring differences between the claimed polypeptides and the naturally occurring polypeptides. In the absence of "the hand of man", the naturally occurring processes are considered non-statutory subject matter. See Diamond v. Chakrabarty, 447 U.S. 303, 206, USPQ 193 (1980) and M.P.E.P. 2105.

Claim Rejections - 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 (3-5 dependent therefrom), 2 and 6 (7 dependent therefrom) recite the phrase, "amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4," which is unclear. It is unclear with respect to what Applicants intend as being encompassed in an amino acid sequence that is "represented by" SEQ ID NO:2 or SEQ ID NO:4 because such a "sequence represented by" can be broadly interpreted to include additional amino acid residues, sequences or modifications other than SEQ ID NO: 2 or SEQ ID NO:4.

Claims 1 (3-5 dependent therefrom) and 6 (7 dependent therefrom) recite the phrase, "Akt2", which is unclear. It is not clear with respect to what Applicants intend as being encompassed by "Akt2". In the interest of advancing prosecution, "Akt2" is interpreted as any serine/threonine kinase, based on paragraphs [0005], [0013] and [0084] of the specification.

Claim 6 (7 dependent therefrom) recites the phrase, "binds to Akt2, with Akt2," which is confusing and unclear. It is whether the amino acid sequence binds to, or with, or binds to and with Akt2. In the interest of advancing prosecution, it is interpreted to be "binds to Akt2."

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-7 are rejected under 35 U.S.C. § 112, first paragraph, written description, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1-7 are directed to:

(A) a polypeptide which comprises the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, or an amino acid sequence in which from any 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, and which binds to any Akt2,

(B) a method for screening a substance which inhibits binding of a polypeptide described in claim 1 or claim 2 or a polypeptide consisting of any amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to any Akt2, with any Akt2, which comprises allowing (1) the aforementioned polypeptide or a cell expressing the aforementioned polypeptide, to contact (2) a substance to be tested, measuring binding of said polypeptide with any Akt2, and selecting a substance which inhibits the aforementioned binding.

To satisfy the written description aspect of 35 U.S.C. § 112, first paragraph, for a claimed genus of [compositions or methods], it must be clear that: (1) the identifying characteristics of the claimed [compositions or methods] have been disclosed, e.g.,

structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these; and (2) a representative number of species within the genus must be disclosed.

The specification discloses examples of SEQ ID NO: 1 or 3 encoding an amino acid sequence consisting of SEQ ID NO: 2 or 4 respectively. However, this is an inadequate written description for a polypeptide which comprises an amino acid sequence in which from *any* 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, and which binds to *any* Akt2. Also, the specification provides examples of a method for screening a substance which inhibits binding of a polypeptide consisting of SEQ ID NO:2 or SEQ ID NO:4. However, the specification lacks written description for a method for screening a substance which inhibits binding of a polypeptide consisting of *any* amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to *any* Akt2, with *any* Akt2.

Claims 1 (3-5 dependent therefrom), 2 and 6 (7 dependent therefrom) do not clearly recite a structure with respect to the additional amino acid sequences and/or modifications that are encompassed within the "amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4", (see above 112 2nd paragraph rejection). The specification does not provide a disclosure of any particular structure to function/activity relationship in the "amino acid sequence represented by SEQ ID NO:2 or SEQ ID

NO:4." Further, the specification lacks description with respect to what function, if any, is required for a polypeptide which comprises the amino acid sequence in which from *any* 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4.

With respect to Claim 6, the specification does not provide a disclosure of any particular structure to function/activity relationship between a polypeptide consisting of *any* amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to Akt2, with Akt2 (see above 112 2nd paragraph rejection). Further, the specification fails to describe any identification of structural characteristics or properties of any nucleotide sequence that encodes the amino acid sequence in which from *any* 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4. Similarly, the specification fails to describe any identification of structural characteristics or properties of any nucleotide sequence that encodes a polypeptide consisting of *any* amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to Akt2, with Akt2 (see 112 2nd paragraph rejection above).

Also, there is no disclosure with respect to the structural and functional properties of Akt2, and what structure, if any, is required for Akt2 to bind a polypeptide which comprises the amino acid sequence in which from *any* 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, a polypeptide consisting of *any* amino acid sequence having a homology

of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, or a polypeptide consisting of SEQ ID NO: 2 or 4.

Given the lack of additional representatives of a polypeptide which comprises an amino acid sequence in which from *any* 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, or a polypeptide consisting of *any* amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to Akt2, Applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise, and exact terms that a skilled artisan would recognize Applicants were in possession of the claimed invention.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement, because the specification, while being enabling for a polypeptide consisting of SEQ ID NO: 2 or 4, does not reasonably provide enablement for a polypeptide which comprises the amino acid sequence in which from any 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, and which binds to any Akt2, and a method for screening a substance which inhibits binding of a polypeptide consisting of any amino acid sequence having a homology of 90% or more with the amino acid

sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to any Akt2, with any Akt2, which comprises allowing (1) the aforementioned polypeptide or a cell expressing the aforementioned polypeptide, to contact (2) a substance to be tested, measuring binding of said polypeptide with any Akt2, and selecting a substance which inhibits the aforementioned binding. Therefore, the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). The Court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount or direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or

unpredictability of the art, and (8) the breadth of the claims. While all of these factors are considered, a sufficient amount for a *prima facie* case is discussed below.

Claims 1-7 are so broad as to encompass a polypeptide which comprises an amino acid sequence in which from any 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, and which binds to any Akt2, and a method for screening a substance which inhibits binding of a polypeptide consisting of any amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to any Akt2, with any Akt2.

The claims rejected under this section of U.S.C. 112, first paragraph, place minor structural limits on the "an amino acid sequence in which from 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4", or "an amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to Akt2, with Akt2". Since the amino acid sequence of a peptide determines its structural and functional properties, predictability of which peptides can be used while obtaining the desired function requires a knowledge of and guidance with regard to which amino acids in the peptide's sequence, if any, are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the peptide's structure relates to its desired function. In addition, the scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the

extremely large number of different peptides/proteins. The specification, however, only discloses a peptide consisting of SEQ ID NO: 2 or 4.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple insertions, deletions, substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all substitutions and all modifications of any 1 to 10 amino acids in SEQ ID NO:2 or SEQ ID NO:4, and all amino acid sequences having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 because the specification does not establish: (A) regions of the protein structure which may be modified without affecting Akt2 binding of a polypeptide consisting of SEQ ID NO: 2 or 4; (B) the general tolerance of a polypeptide consisting of SEQ ID NO: 2 or 4 to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any amino acid residue of a polypeptide consisting of SEQ ID NO: 2 or 4 with an expectation of obtaining the desired binding; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Because of this lack of guidance, and the fact that the relationship between the polypeptide sequence of a protein/antibody and its native conformation (i.e. its binding activity) are not well understood and unpredictable (e.g., see Ngo et al. in The Protein Folding Problem and Tertiary Structure Prediction, 1994, Merz et al. (ed.), Birkhauser, Boston, MA, pp. 433 and 492-495, Ref: U, Form-892), it would require undue experimentation for one skilled in the art to determine a polypeptide which comprises an amino acid sequence in which from *any* 1 to 10 amino acids are deleted, substituted and/or inserted in the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4, and which binds to any Akt2, and a method for screening a substance which inhibits binding of a polypeptide consisting of any amino acid sequence having a homology of 90% or more with the amino acid sequence represented by SEQ ID NO:2 or SEQ ID NO:4 and which binds to Akt2, with Akt2.

Conclusion

Claims 1-7 are rejected, and Claims 8 and 9 are objected to.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae W. Lee whose telephone number is 571-272-9949. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathleen Kerr can be reached on 571-272-0931. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patent Examiner: Jae W. Lee, Ph.D.

RICHARD HUTSON, PH.D.
PRIMARY EXAMINER